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Pacific Region
Canadian Science Advisory Secretariat
Science Response 2012/030

SCIENCE RESPONSE TO INFORMATION REQUESTS SUBMITTED TO THE ENBRIDGE PIPELINE PROJECT ENVIRONMENTAL IMPACT ASSESSMENT HEARINGS RESPECTING CHEMICAL PROPERTIES

Context

Fisheries and Oceans Canada's (DFO) Environmental Assessment and Major Projects Division (EAMP), Pacific Region, requested that DFO Science, Pacific Region, on May 15, 2012, provide information regarding specific Information Requests (IRs) submitted to the Enbridge Review Panel that DFO Science has the expertise to evaluate. As the IRs for which Science advice was requested cover a range of issues and scientific disciplines, separate Science Responses have been developed for each category of IRs, and in some cases specific IRs. In addition to science related questions, some IRs included elements that were questions pertaining to DFO policy, management or legal information. This Science Response addresses the scientific elements of the following questions:

- In response to Information Request No. 2 from the federal government, section 2. 17(d), the Proponent stated that a detailed listing of chemicals likely to be used or associated with construction activities, maintenance, and associated tanker traffic is not available. How is this data relevant to the assessment of potential risks associated with the Project? [NGP Response to Federal Government IR No.2, number 2.17(d); Volume 2, Part 2, section 38]
- Does DFO have a description of the potential effects of condensate? If so, please provide it. [Volume 2, Part I, section 148].

This Science Response report is from the Fisheries and Oceans Canada, Canadian Science Advisory Secretariat, Regional Science Special Response Process (SSRP) of May 29th, 2012 on the Science advice in response to information requests submitted by Intervenors to the Enbridge Northern Gateway pipeline project environmental assessment Panel Review Process. Additional publications from this process will be posted as they become available on the Fisheries and Oceans Canada Science Advisory Schedule at www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm.

Background

The Enbridge Northern Gateway Project proposes to ship dilute bitumen from Kitimat, British Columbia to markets in China and California with tankers of the class Very Large Crude Carriers (VLCC) (Vol. 1, B1-2, Enbridge Northern Gateway Project Section 52 Application). The tanker route from Kitimat through confined waterways in British Columbia and then into open waters of Hecate Strait, Dixon Entrance and Queen Charlotte Sound in British Columbia are illustrated in Figure 1. For assessment purposes Enbridge Northern Gateway defines two areas, the Confined Channel Assessment Area (CCAA) (Figure 2) and the Open Water Assessment Area (OWA) which is BC waters to the territorial sea limit (Figure 1). Incoming ships will deliver cargoes of condensate. Enbridge Northern Gateway estimate 71 condensate and 149 oil tankers call in at the Kitimat terminal for a total of 440 transits per year (Vol. 8C, B3-37, Enbridge Northern Gateway Project Section 52 Application). A marine terminal will be

constructed near Kitimat with two tanker berths and one utility berth (Vol. 1, B1-2, Enbridge Northern Gateway Project Section 52 Application). The Project Effected Assessment Area (PEAA) that will be associated with the terminal construction is illustrated in Figure 3.

Two IR submissions were made to the Joint Review Panel (JRP) by DFO. Enbridge Northern Gateway provided responses to requests for information in the IRs. Since then Intervenor review of the Environmental Assessment documents prepared by the proponent (Enbridge Northern Gateway) and of the IRs and the responses by the proponent has resulted in a series of further questions to DFO by Intervenors.

Figure 1. Map illustrating the proposed tanker routes through the Confined Channel and Open Water Assessment Areas (CCAA and OWA). The OWA extends to the territorial sea boundary (from Volume B9-42 Enbridge Northern Gateway Project).

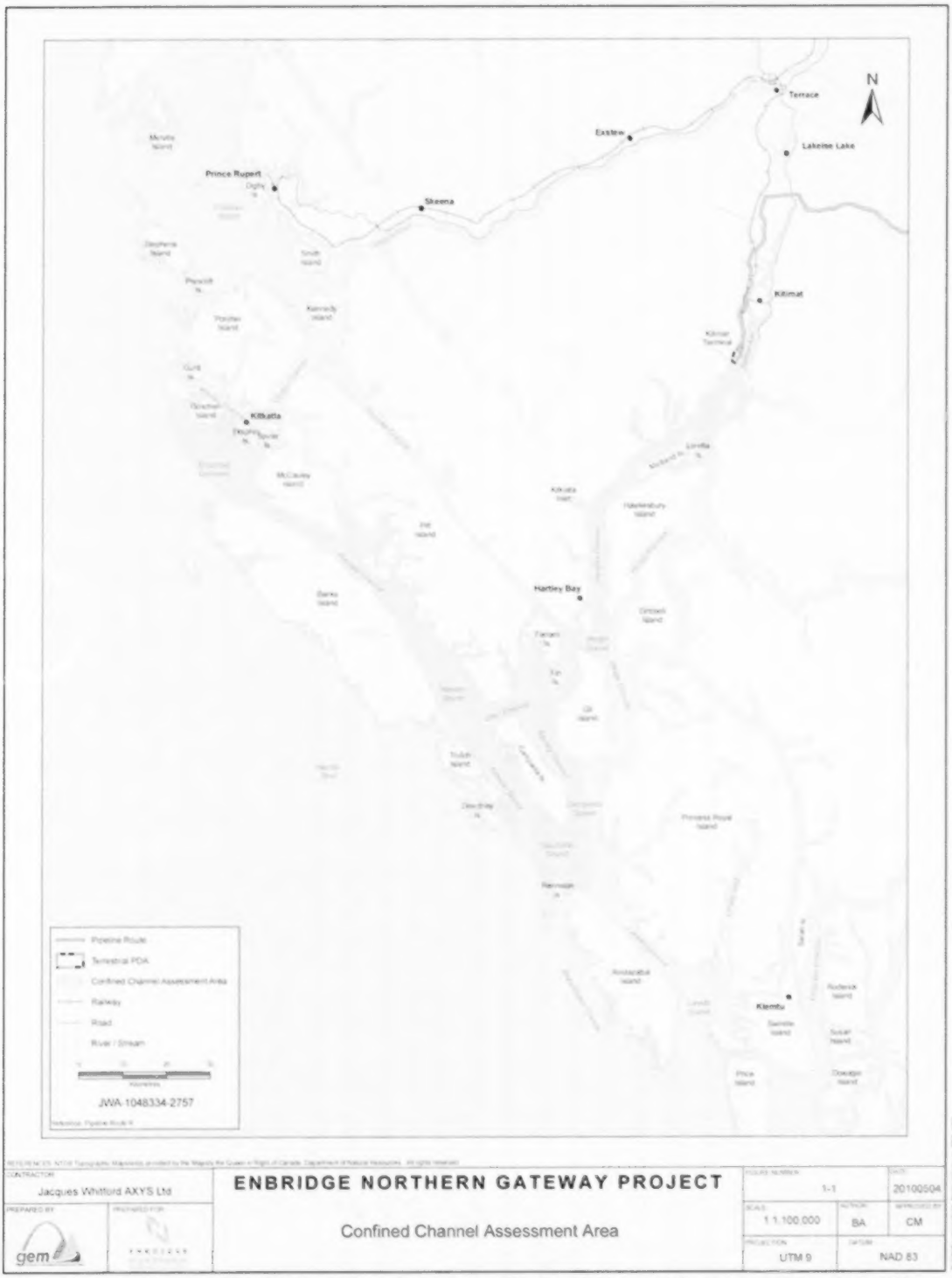

Figure 2. Map illustrating the location and extent of the Confined Channel Assessment Area (CCAA) (from Volume 8B Enbridge Northern Gateway Project Section 52 Application).

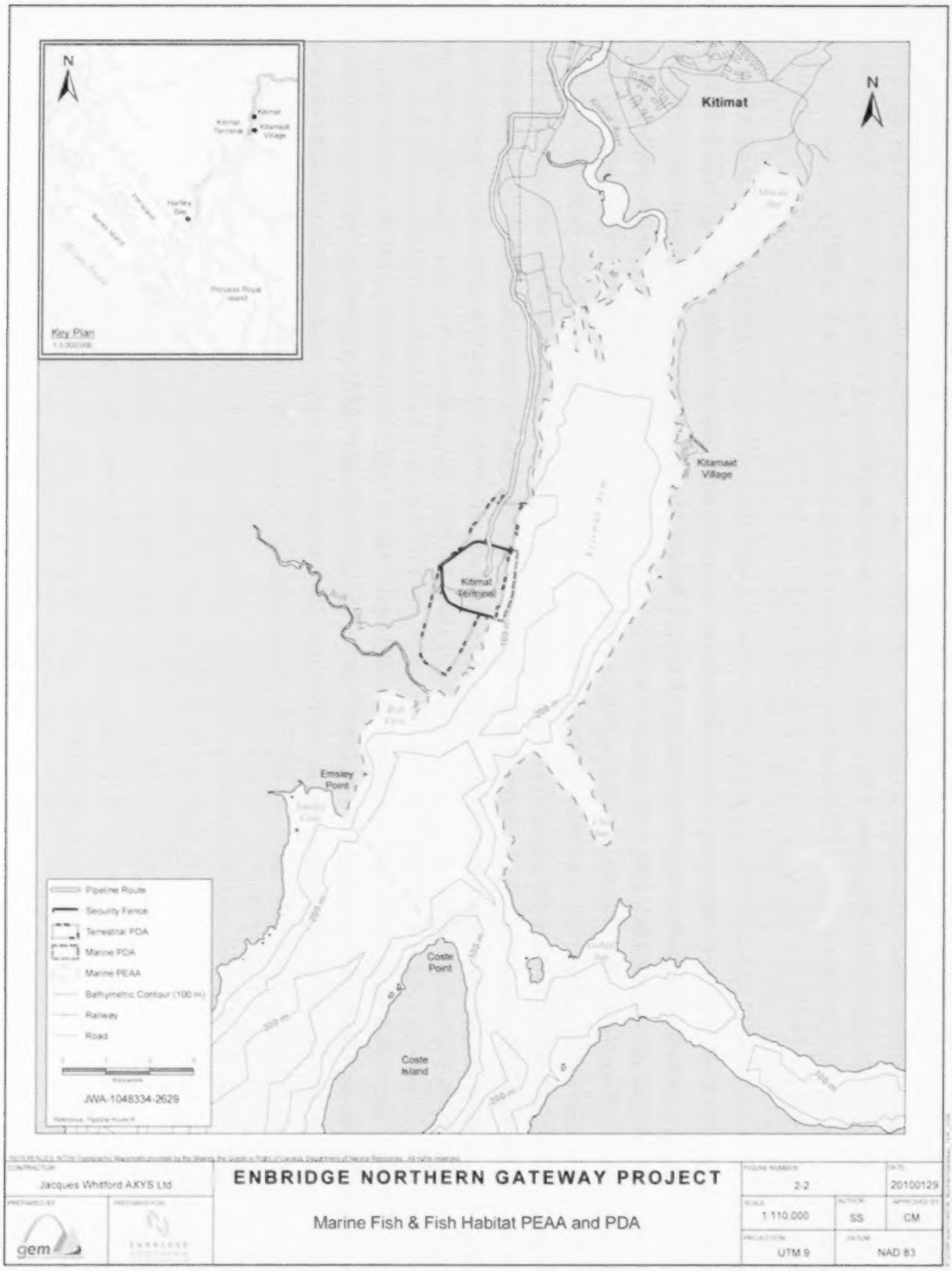

Figure 3. Map illustrating the location and extent of Project Effect Assessment Area (PEAA). (from Enbridge Northern Gateway Project Technical Data Report, Marine Fish and Fish Habitat 2010).

Analysis and Responses

DFO Science requested a list of the chemicals likely to be used or associated with construction activities, maintenance, and associated tanker traffic as well as a more comprehensive and rigorous analysis of the existing polyaromatic hydrocarbons (PAHs) in the PEAA than had been provided in the EA. DFO Science also expressed concern that the geographic extent of the proponent's sediment sampling to identify existing contaminants was not adequate (IR 2.17). The routine approach to the determination of PAHs in environmental samples described by the 'USEPA 16' list provides a very limited PAH profile. High resolution analysis is increasingly the norm in scientific studies, and would increase the number of PAH compounds detected in samples significantly. This would better enabling source fingerprinting and risk assessment as they relate to historical vs present-day activities. High resolution analyses are necessary to adequately characterize environmental baselines and enable source differentiation in the area.

With regard to Persistent Organic Pollutants (POPs) the proponent is unlikely to contribute to the deposition of PCBs as their use has been banned in Canada since 1977, but these POPs continue to represent a threat to marine mammals and humans that rely on food webs. PCBs are present in the PEAA as a result of historical industrial activity in Kitimat Arm. Dredging and other sediment disturbance in conjunction with construction of the marine terminal can be expected to re-suspend contaminated sediment in both the PEAA and at the approved ocean disposal site. In addition, the release of large quantities of dioxins and furans prior to source controls in 1989 contributed to extensive sediment contamination and to the contamination of invertebrate fisheries. Any construction or dredging activities have the potential to mobilize these effectively buried sediment contaminants, whether through direct dredging or the disposal at a designated marine site. A baseline assessment of sediment POPs profiles would help to ensure adequate scrutiny and management of sediments or dredge materials.

DFO Science has not led studies on the effects of condensate on Pacific marine biological resources. Condensate is primarily a mixture of aliphatic hydrocarbons, hexane, benzene, toluene and xylene (Sammarco et al. 1997; Villanueva et al. 2008). Effects from exposure to condensate have been documented in biota and ecosystems (Lucas and Freedman 1989; Sammarco et al. 1997; Villanueva et al. 2008)

DFO Science recognizes that an understanding of the risks to marine biological resources from the Enbridge Northern Gateway Project requires a rigorous understanding of both existing baseline levels of contaminants and a comprehensive environmental protection plan.

Conclusions

Without a detailed list of the chemicals that will be used and the environmental protection plans, DFO Science can not, at this time, assess potential risk from construction and operation of the marine terminal.

Sources of Information

Lucas, Z. and Freedman, B. 1989. The effects experimental spills of natural gas condensate on three plant communities on Sable Island, Nova Scotia, Canada. Oil and Chemical Pollution Vol 5 (4) 1989: 263-272.

Sammarco, P.W. 1997. Effects of Natural Gas Pipeline Condensate and Crude Oil Spills, and Comments on Remediation, with emphasis on South Louisiana Salt Marshes: A Review. http://www.lumcon.edu/research/faculty/spillRep.pdf Accessed May 31, 2012

Villanueva, R.D., Montaño, M.N.E. and Yap, H.T. 2008. Effects of natural gas condensate – water accommodated fraction on coral larvae. Marine Pollution Bulletin, 56 (2008) pp 1422–1428.

Contributors

Name	Affiliation
Peter Ross	DFO Science, Pacific Region
Linda Nichol	DFO Science, Pacific Region
Marilyn Joyce (Editor)	DFO Science, Pacific Region

Approved by

Robin Brown
Manager, Ocean Science Division
DFO Science, Pacific Region
Nanaimo, BC

This Report is Available from the

Centre for Science Advice - Pacific Region
Fisheries and Oceans Canada
3190 Hammond Bay Road
Nanaimo, British Columbia
Canada, V9T 6N7

Telephone: 250-756-7208
E-Mail: CSAP@dfo-mpo.gc.ca
Internet address: www.dfo-mpo.gc.ca/csas-sccs/

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